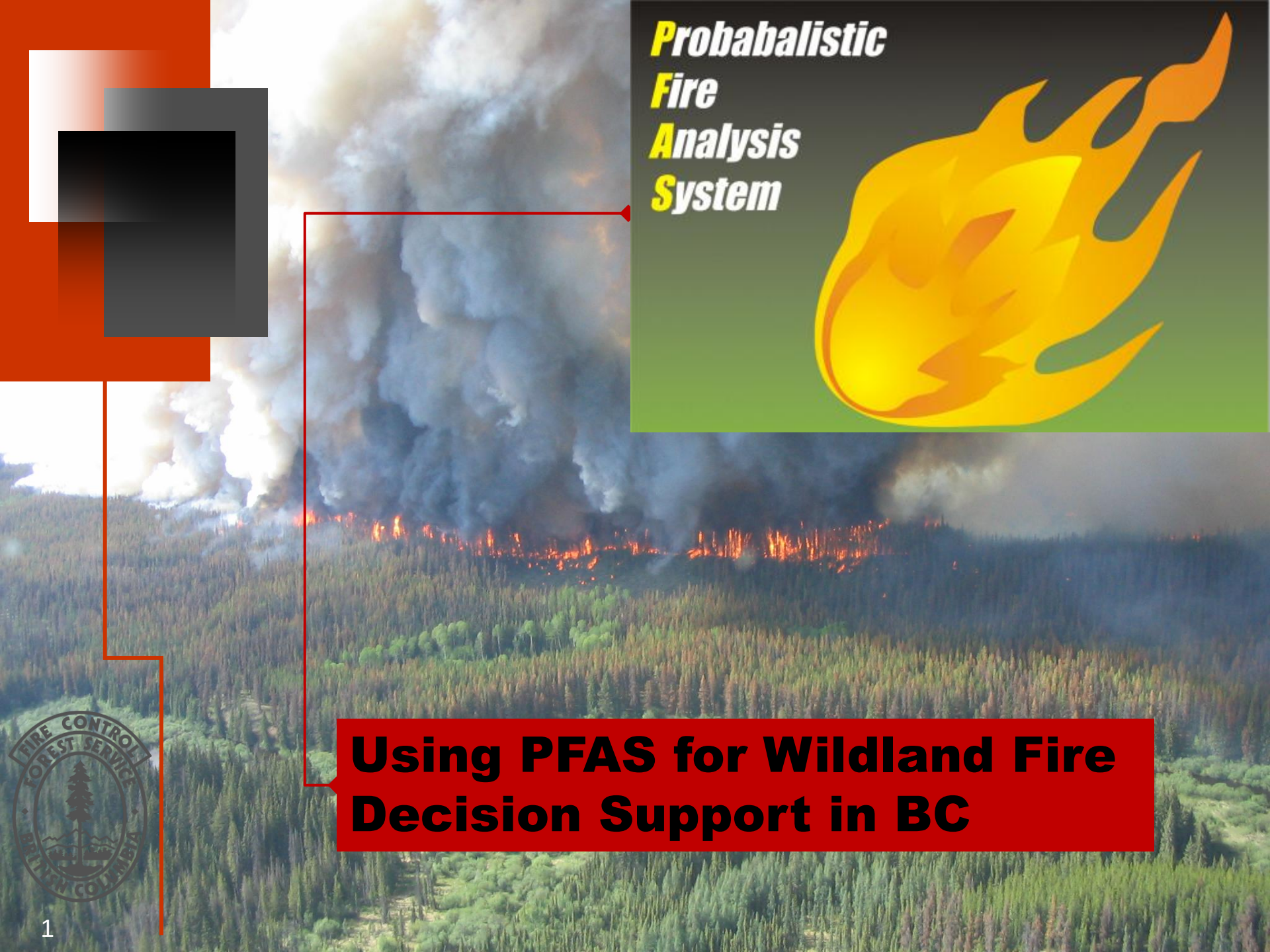
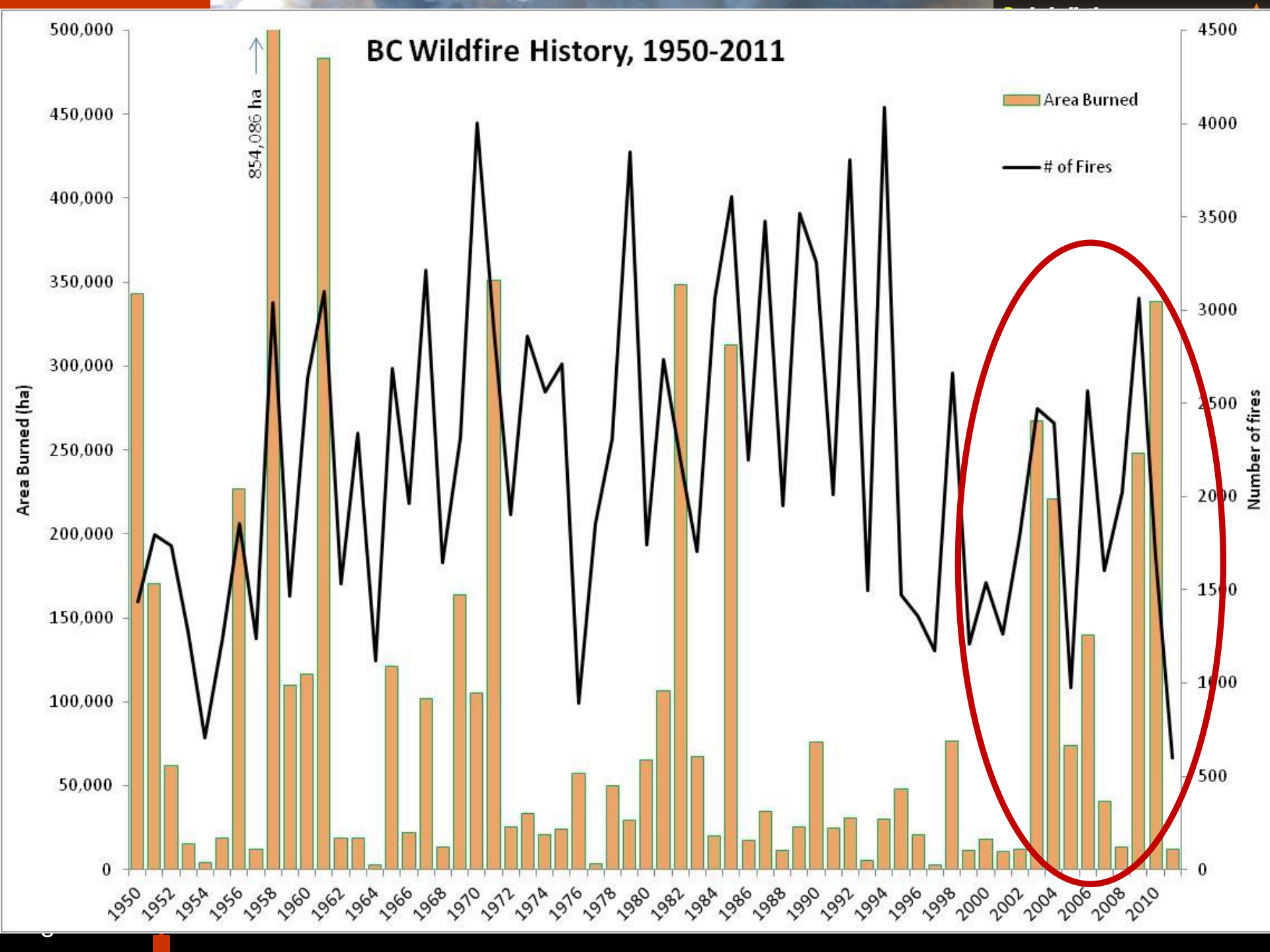


Using PFAS for Wildland Fire Decision Support in BC

Probabalistic
Fire
Analysis
System

Overview

- History – PFAS in BC
- PFAS data needs
- CFFDRS primer
- PFAS run examples
- Outputs and decision-making
- Next steps


BC Wildfire History, 1950-2011
854,086 ha
Area Burned
# of Fires
Area Burned (ha)
Number of fires
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010

Probabalistic
Fire
Analysis
System

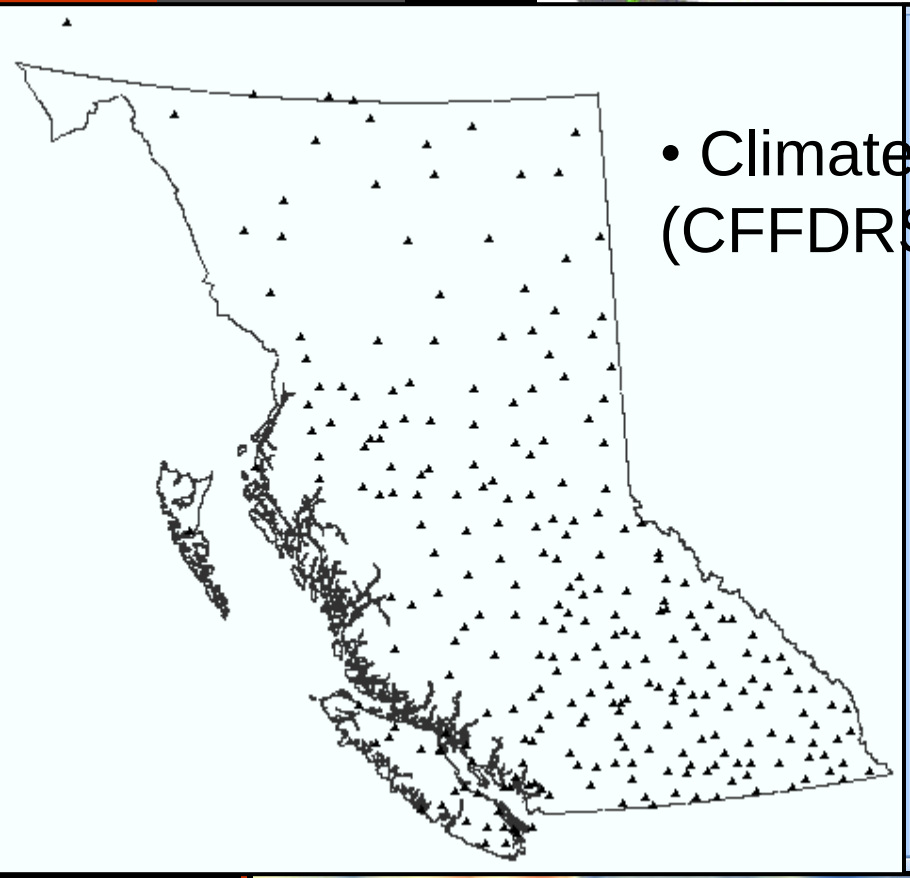
PFAS in BC - History

- Seeking decision support on Modified Response fires (WFU)
  - Very busy 2009 fire season
- CFS staff deployed to BC
  - Modeled ~40 fires
  - Average of 2.5 person-days/fire
- Output viewed well by Ops staff
- Effort to speed up process, in house

FIRE CONTROL FOREST SERVICE BRITISH COLUMBIA

Probabalistic Fire Analysis System

PFAS data needs



- Climate data (CFFDRS, FWI)

OBJEC	station_cod	weather_date	station_name	temperatur	temp_v	relative_h	rh_va	wind_speec
1	19	19700525	MENZIES CAMP	16	1	67	1	18
2	75	19700525	TOBA CAMP	15.5	1	86	1	3
3	105	19700525	ROSSWOOD	11.5	1	70	1	16
4	141	19700525	MANSON	13	1	55	1	19
5	158	19700525	VANDERHOOF HU	13	1	82	1	13
6	161	19700525	GRASSY PLAINS H	12	1	66	1	5
7	194	19700525	VALEMOUNT HUB	19.5	1	43	1	11
8	206	19700525	TAUTRI	11.5	1	49	1	13
9	328	19700525	PENTICTON RS	21.5	1	36	1	11
10	343	19700525	HOWARD	15.5	1	74	1	0
11	390	19700525	BEAVERDELL	26	1	23	1	11
12	412	19700525	ELKO	23	1	30	1	18
13	427	19700525	NASS CAMP	13.5	1	58	1	29
14	428	19700525	KISPIOX HUB	9.5	1	82	1	5
15	19	19700526	MENZIES CAMP	11.5	1	54	1	24
16	75	19700526	TOBA CAMP	19	1	60	1	10
17	105	19700526	ROSSWOOD	8	1	93	1	10
18	141	19700526	MANSON	10.5	1	34	1	24
19	158	19700526	VANDERHOOF HU	6.5	1	66	1	32
20	161	19700526	GRASSY PLAINS H	7	1	60	1	18
21	194	19700526	VALEMOUNT HUB	11	1	53	1	0
22	206	19700526	TAUTRI	6	1	45	1	8
23	328	19700526	PENTICTON RS	15.5	1	46	1	6
24	343	19700526	HOWARD	17	1	45	1	5

Record: 1 of 1171816 No Filter Search

Probabalistic
Fire
Analysis

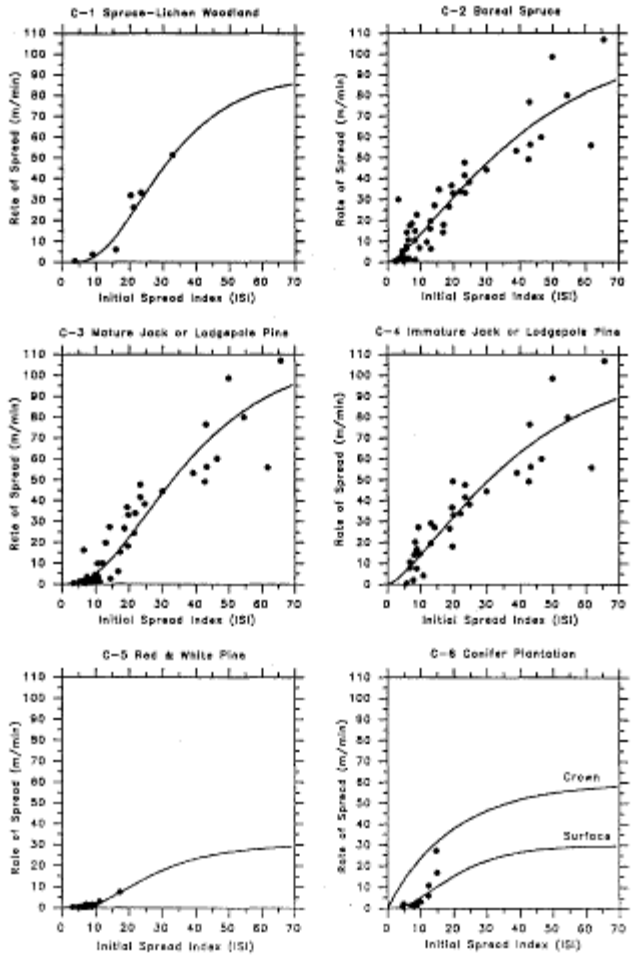
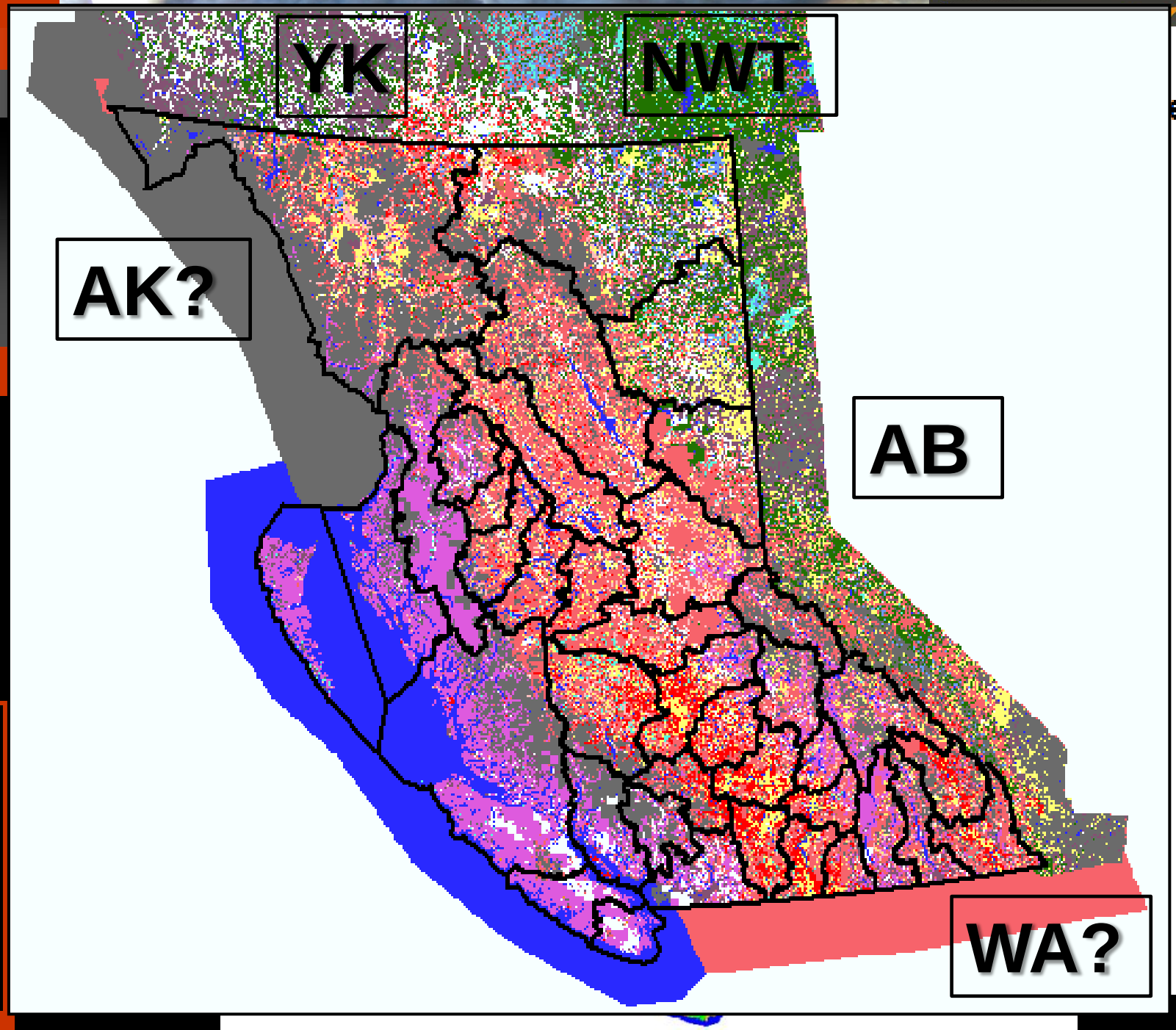


Figure 5. Basic rate of spread–ISI curves for fuel types C-1, C-2, C-3, C-4, C-5, and C-6.


YK
NWT
AK?
AB
WA?

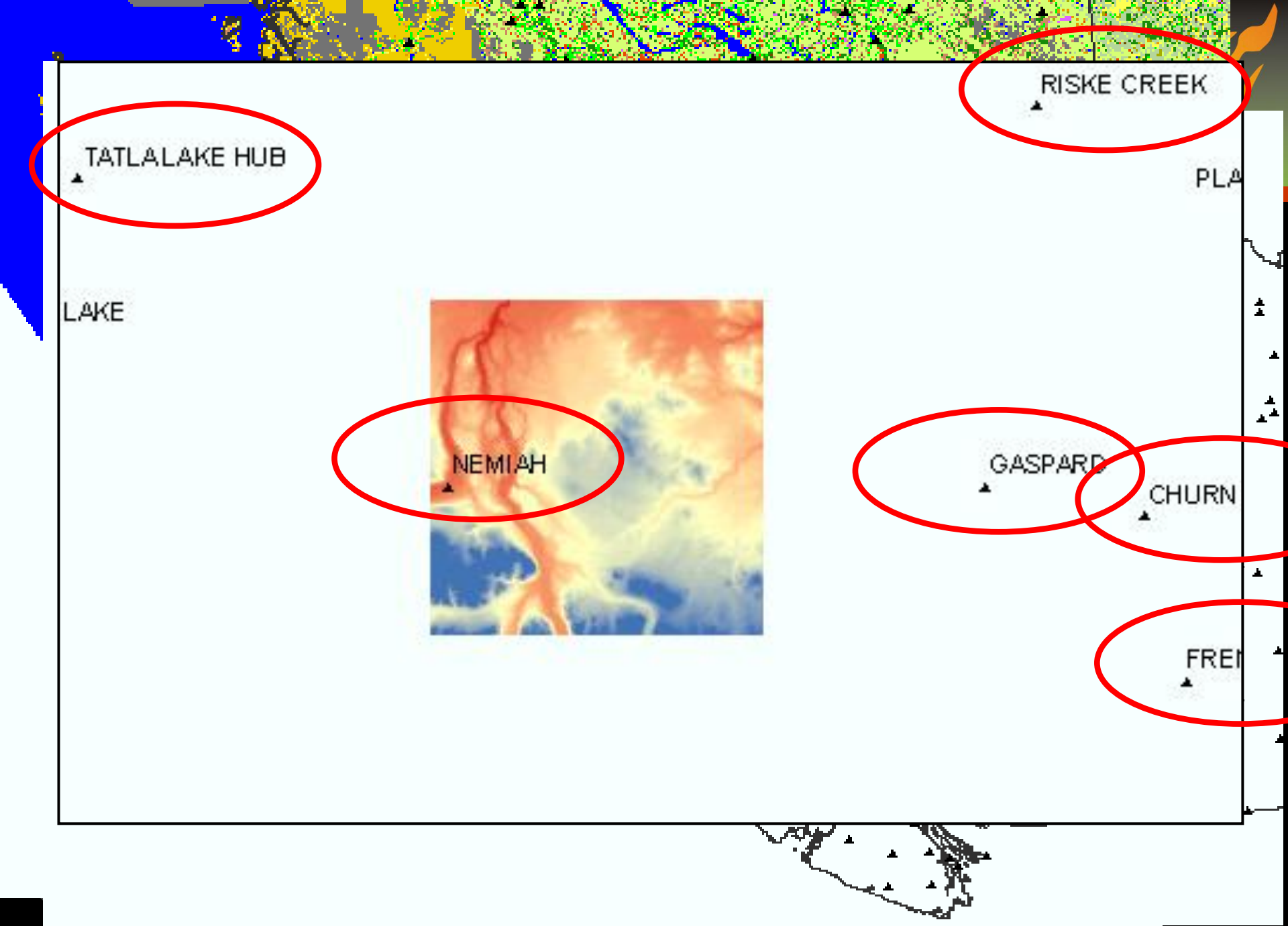
PFAS data needs (3)

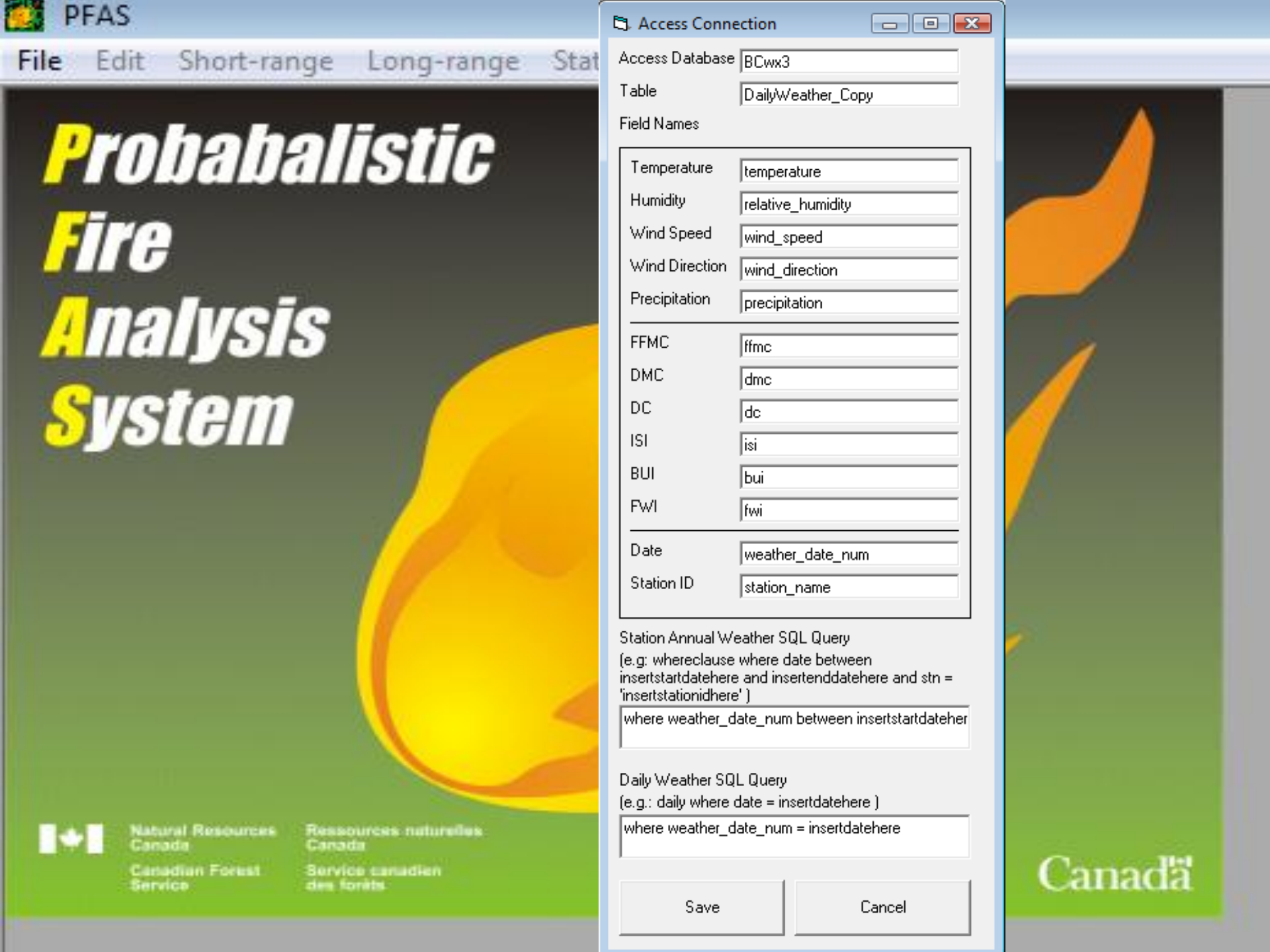
- Data needed in small ASCII grids
  - start with forest inventory in ArcGIS polygons
- Forest inventory → FBP fuel type
  - Excellent in some cases
  - Very poor fit in other cases
  - Major weakness of approach...
- Extraction script (Raster clip for all spatial layers, etc.)

Probabalistic
Fire
Analysis
System

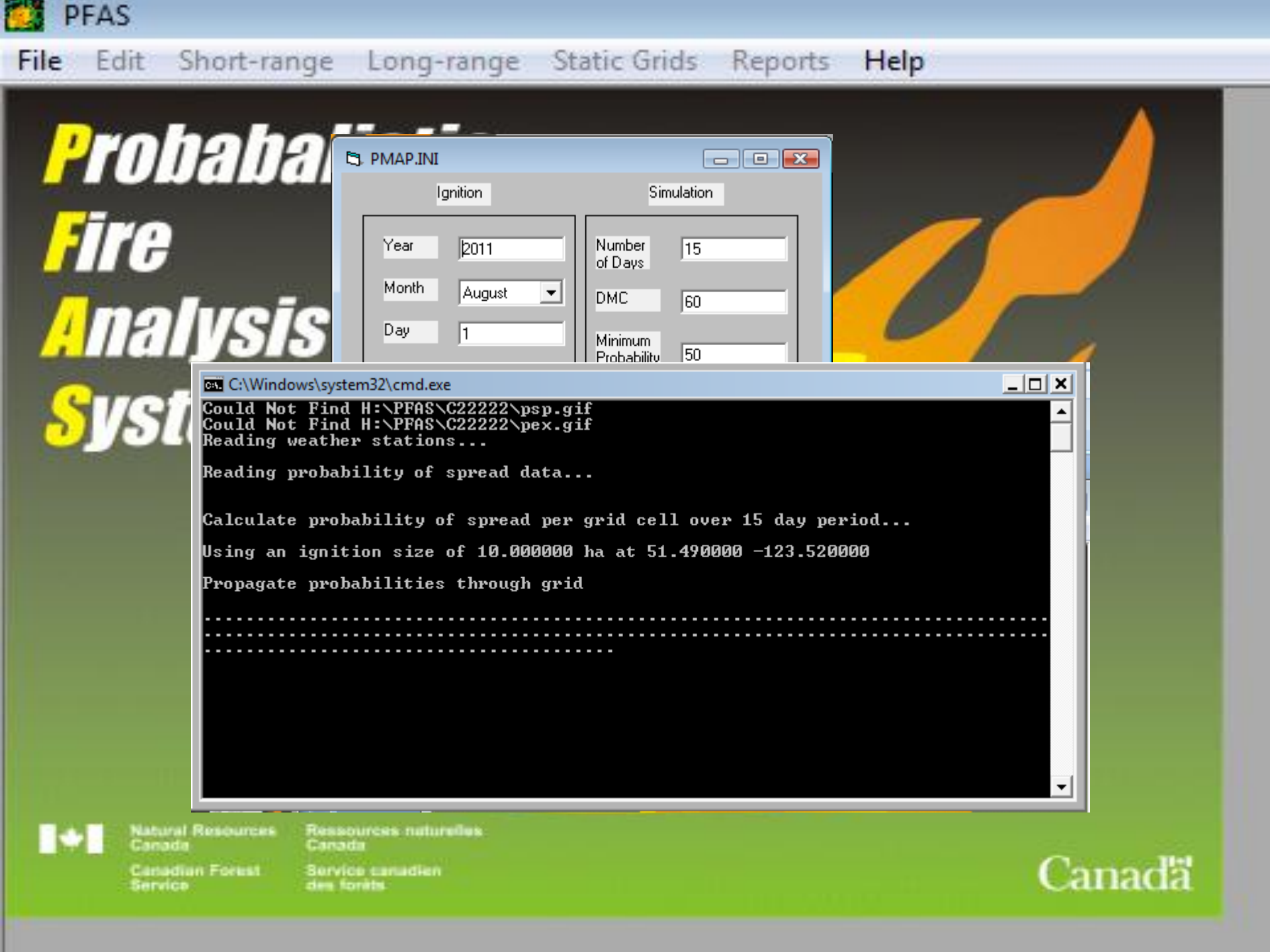
PFAS run examples:

- Data extraction...


RISKE CREEK
TATLALAKE HUB
PLA
LAKE
NEMIAH
GASPARD
CHURN
FREI

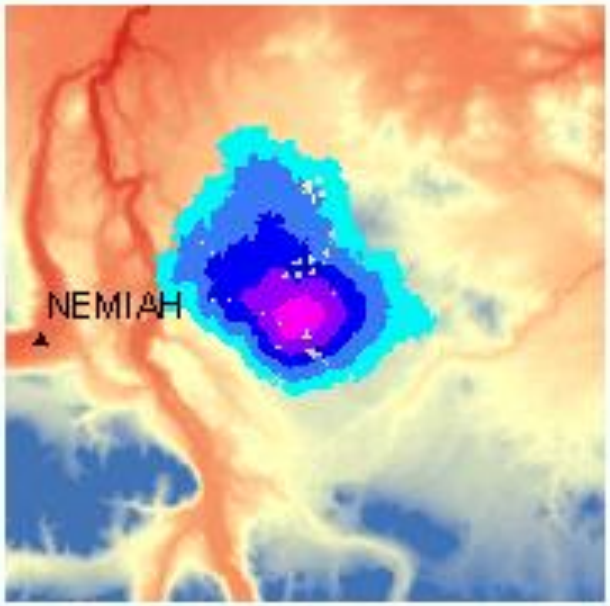

PFAS
File
Edit
Short-range
Long-range
Stat
Probabalistic
Fire
Analysis
System
Natural Resources Canada
Canadian Forest Service
Ressources naturelles Canada
Service canadien des forêts
Canada
Access Connection
Access Database
BCwx3
Table
DailyWeather_Copy
Field Names
Temperature
temperature
Humidity
relative_humidity
Wind Speed
wind_speed
Wind Direction
wind_direction
Precipitation
precipitation
FFMC
ffmc
DMC
dmc
DC
dc
ISI
isi
BUI
bui
FWI
fwi
Date
weather_date_num
Station ID
station_name
Station Annual Weather SQL Query
(e.g: whereclause where date between insertstartdatehere and insertenddatehere and stn = 'insertstationidhere')
where weather_date_num between insertstartdateher
Daily Weather SQL Query
(e.g.: daily where date = insertdatehere)
where weather_date_num = insertdatehere
Save
Cancel


PFAS
File Edit Short-range Long-range Static Grids Reports Help
Probabalistic
Fire
Anal
Syst
C:\Windows\system32\cmd.exe
Reading weather stations...
DailyClause = ''
StnClause = 'where weather_date_num between 19500101 and 19501231 and station_name = 'TATLA LAKE HUB' '
SELECT temperature, relative_humidity, wind_speed, wind_direction, precipitation, ffmc, dmc, dc, isi, bui, fwi, weather_date_num, station_name FROM DailyWeather_Copy where weather_date_num between 19500101 and 19501231 and station_name = 'TATLA LAKE HUB'
Natural Resources Canada
Canadian Forest Service
Ressources naturelles Canada
Service canadien des forêts
Canada


PFAS
File
Edit
Short-range
Long-range
Static Grids
Reports
Help
Probabal
Fire
Analysis
Syst
PMAP.INI
Ignition
Simulation
Year
2011
Month
August
Day
1
Number of Days
15
DMC
60
Minimum Probability
50
C:\Windows\system32\cmd.exe
Could Not Find H:\PFAS\C22222\psp.gif
Could Not Find H:\PFAS\C22222\pex.gif
Reading weather stations...
Reading probability of spread data...
Calculate probability of spread per grid cell over 15 day period...
Using an ignition size of 10.000000 ha at 51.490000 -123.520000
Propagate probabilities through grid
Natural Resources Canada
Canadian Forest Service
Ressources naturelles Canada
Service canadien des forêts
Canada

RISKE CR

TATLALAKE HUB



GASPARD

CHURN CI

Probabalistic
Fire
Analysis
System

Outputs and decisions

- What do you do with output figures?

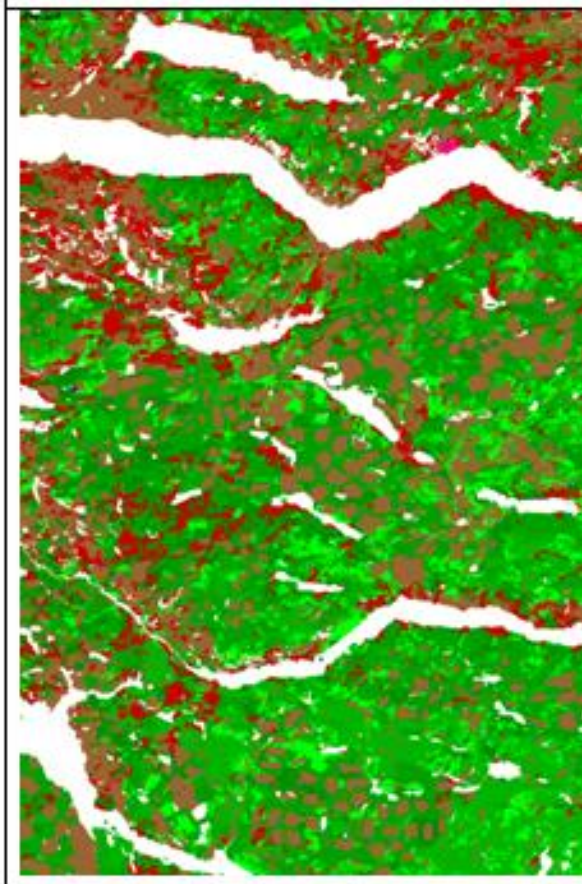
Fire XX - Long Range

Starting Date	July XX, 2009
Starting DMC	99 (Holy Cross 15

Weather stations included	Elevation (m)	Km fir
East Ootsa	1060	4
Holy Cross	1100	2
Grassy Plains	1076	3
Burns Lake	830	5

*Data are weighted inversely with distance to the fire
**Probability of Extinction: Chance of DMC < 20

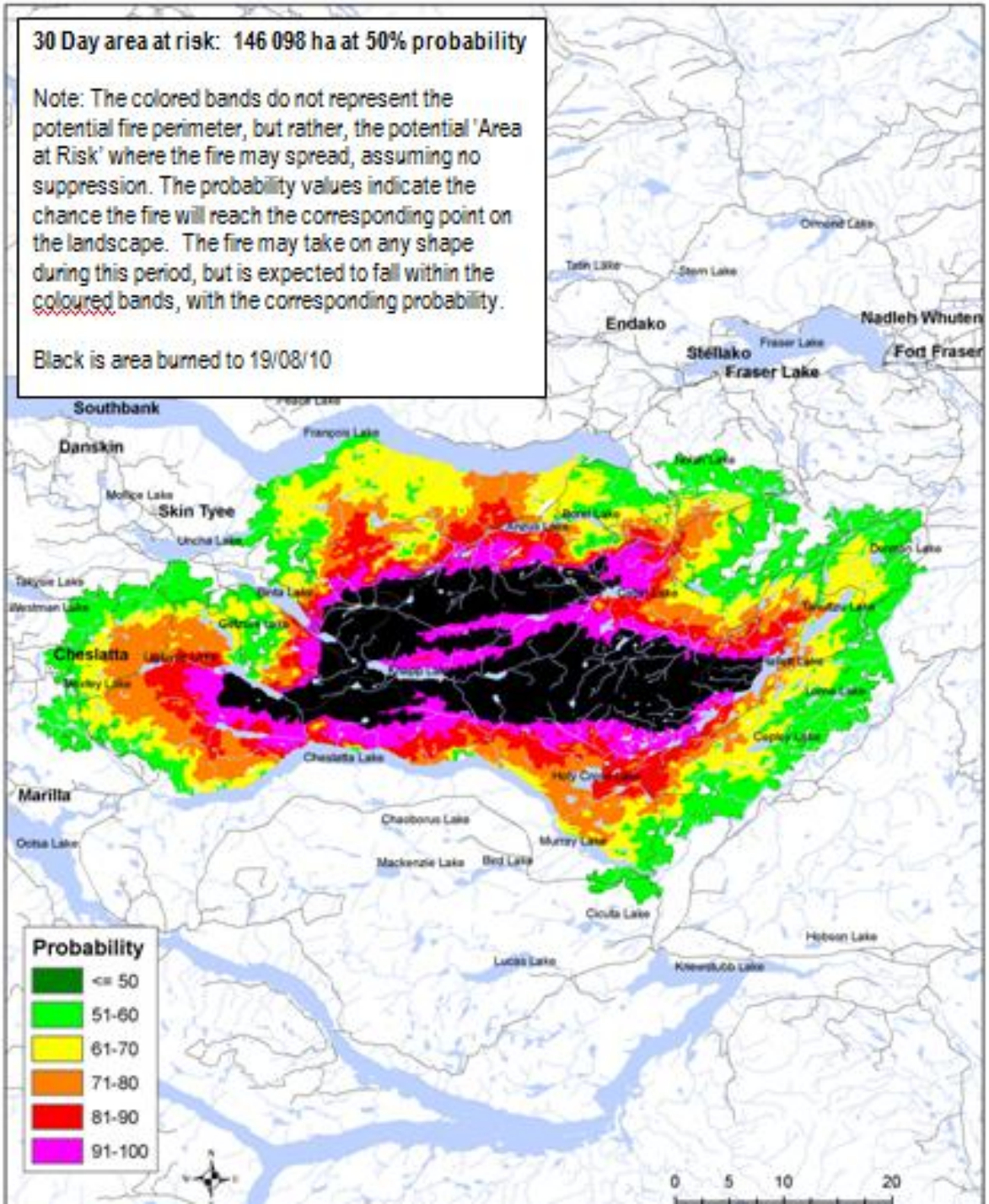
FBP System Fuel Types (Source: BC MOFR



30 Day area at risk: 146 098 ha at 50% probability

Note: The colored bands do not represent the potential fire perimeter, but rather, the potential 'Area at Risk' where the fire may spread, assuming no suppression. The probability values indicate the chance the fire will reach the corresponding point on the landscape. The fire may take on any shape during this period, but is expected to fall within the coloured bands, with the corresponding probability.

Black is area burned to 19/08/10



Probabalistic
Fire
Analysis
System

Outputs and decisions

- Tool for Strategic Operational Planner (SOPL)
- *As a Technical Specialist in Fire Behaviour, provide the PWCC organization with "operational" decision making support from a long range "strategic planning" perspective.*
Position primarily responsible for coordinating, gathering, analyzing, producing and disseminating all long-range fire weather/fire behaviour products into both the PWCC Strategic Plan and the R-SWAP process.

FIRE CONTROL FOREST SERVICE BRITISH COLUMBIA

Questions ?


FIRE CONTROL
FOREST SERVICE
BRITISH COLUMBIA